

### **Amendments to the Claims:**

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. Material to be inserted is in **bold and underline**, and material to be deleted is in ~~strikeout~~ and/or in ~~[[double brackets]]~~ if the deletion would be difficult to see.

#### **LISTING OF CLAIMS:**

1. (Currently amended) A method for controlling an engine having an exhaust with an emission control device capable of storing NO<sub>x</sub> during lean operating conditions, and converting at least a portion of said NO<sub>x</sub> during stoichiometric or rich operating conditions, the method comprising:

operating the engine to produce a lean exhaust gas mixture fed to the emission control device;

after said lean operation, operating the engine to produce a rich exhaust gas mixture fed to the emission control device, said rich ~~air-fuel ratio~~ **exhaust gas mixture having a rich air-fuel ratio, wherein the rich air-fuel ratio is selected** ~~determined~~ as a function of at least the oxygen storage capacity of the device.

2. (Currently amended) The method of claim 1 wherein said rich air-fuel ratio is further based on temperature of the device; **and**

**wherein the method further comprises estimating the oxygen storage capacity of the emission control device based on an average of several rich to lean transition times.**

3. (Original) The method of claim 1 wherein as oxygen storage capacity of the device decreases, the rich air-fuel ratio becomes less rich.

4. (Previously presented) The method of claim 1 wherein the rich air-fuel ratio is selected to provide a select amount of CO and H<sub>2</sub>.

5. (Original) The method of claim 1 wherein the oxygen storage capacity of the device is determined based on device degradation.

6. (Original) The method of claim 5 wherein device degradation is based on at least one of an amount of sulfur contaminating the device and thermal degradation of the device.

7. (Original) The method of claim 1 wherein the oxygen storage capacity of the device is determined from rich to lean transition time.

8. (Currently amended) A method for controlling an engine having an exhaust with an emission control device capable of storing NO<sub>x</sub> during lean operating conditions, and converting at least a portion said NO<sub>x</sub> during stoichiometric or rich operating conditions, the method comprising:

operating the engine to produce a lean exhaust gas mixture fed to the emission control device;

**estimating an oxygen storage capacity of the emission control device based on an average of several rich to lean transition times;**

estimating an amount of NOx release based on ~~[[an]]~~ **the** oxygen storage capacity of the emission control device;

after said lean operation, operating the engine to produce a rich exhaust gas mixture fed to the emission control device, said rich air-fuel ratio is determined based at least on the amount of NOx released.

9. (Original) The method of claim 8 wherein said rich air-fuel ratio is further based on temperature of the device.

10. (Original) The method of claim 8 wherein said amount of NOx release is further based on operating conditions.

11. (Original) The method of claim 8 wherein as oxygen storage capacity of the device decreases the rich air-fuel ratio becomes less rich.

12. (Previously presented) The method of claim 8 wherein the rich air-fuel ratio is selected to provide a selected amount of CO and H<sub>2</sub> to the device.

13. (Original) The method of claim 8 wherein the oxygen storage capacity of the device is determined based on device degradation.

14. (Original) The method of claim 13 wherein device degradation is based on an amount of sulfur contaminating the device.

15. (Cancelled)

16. (Cancelled)